

## A new genus of the subfamily Cubacubaninae (Insecta: Zygentoma: Nicoletiidae) from a Mexican cave

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*Abstract.*—A new genus and species (*Squamigera latebricola*) of the subfamily Cubacubaninae from a Mexican cave is described. The new genus is distinguished from almost all the genera of this subfamily by having scales. It differs from *Texoreddellia*, the only other genus of this subfamily with scales, by the morphology of scales and other characters, which are discussed.

The family Nicoletiidae is a frequently encountered group in caves of México and Central America (Reddell 1981), but with few exceptions, most species await description. During exploration of several caves in the states of Guerrero and Morelos, México, several specimens of this family were collected. A specimen collected from “Pozas Azules” cave is a previously undescribed genus with scales of the subfamily Cubacubaninae. Available material is of particular interest because most members of the subfamily lack scales. Only two genera have them: *Texoreddellia* (Wygodzinsky 1973) and the new genus described here. However, the morphology of the scales among other characteristics is drastically different for these two genera; therefore, they are probably not closely related.

### Study Area

The material was collected in “Pozas Azules” cave (Taxco de Alarcón Municipality, Guerrero State, México, 18°36'40"N, 99°33'25"W). The cave is 1399 m long and +53 m deep. This cave is the resurgence of a cave system formed by Isote cave and Cueva de las Pozas Azules. Total length of system is almost three kilometers and depth is 230 m (for a detailed description of both caves' topography, see Espinasa-Pereña 1989).

This cave system has a very peculiar fauna. Apart from the new genus described here, a freshwater polychaete has been described as a troglobite (Solís-Weiss & Espinasa 1991). Some undescribed copepods living in association with the polychaete will probably be characterized as troglobites. Other organisms collected in the system are troglophile ricinulids (*Cryptocellus boneti*), collembola of the families Entomobridae and Sminthuridae, beetles, two species of spiders, millipedes, mites, protozoa and bacteria (*Salmonella*, *Klebsiella*, and *Bacillus*). To date, physical connection between Isote cave and Cueva de las Pozas Azules has not been explored because both ends of the caves end in sumps. Connection is assumed in part on geohydrological evidence (Espinasa-Pereña 1989), by the proximity of the two final sumps found in each cave (less than 20 m apart), and most importantly, by the shared fauna mentioned above.

*Cave formation.*—The limestone rock was formed during the lower Cretaceous period (Albian, Cenomanian, and Turonian). Elevation occurred at the end of Cretaceous (Maastrichtian), when erosion began. Presence of an igneous rock (Riolite tilzapotla) overlaying the limestone from which the water that formed the cave comes, seems to indicate that the cave was not formed until late Oligocene (López-Ra-

mos 1974). It is also known that the cave was already formed in the Quaternary because there is evidence in cave sediments of climatic changes related to this period (Espinasa-Pereña, pers. comm.). Thus, if the cave was formed at some point between Oligocene and Quaternary, there is reason to assume that the troglobites in this cave system separated from the outside communities at more or less the same time.

#### Materials and Methods

The specimen was found crawling on the cave wall. It was placed into a vial with 70% alcohol. Dissections were made with the aid of a stereo microscope and the different parts of the body were mounted in fixed preparations with Hoyer's solution.

All illustrations were made with the aid of a camera lucida attached to a compound microscope.

The type is deposited in the following collection: LESM-DB-MEX (Laboratory of Ecology and Systematic of Microarthropods, Department of Biology, Faculty of Sciences, UNAM, México D. F.) Catalog number: ZYG-2.

#### *Squamigera*, new genus

*Diagnosis.*—A member of the subfamily Cubacubaninae with scales. Cerci of male with modified spines. Parameres with a cleft on apex.

*Description.*—Body robust, long, approximately parallel-sided, thorax slightly but distinctly wider than abdomen. Scales present, numerous, and multiradiate. Form mucronate to emarginate, with borders slightly serrated. Head, thorax, and abdomen with scales and setae. Legs with scales on proximal articles. Mouthparts and abdominal stylets only with setae.

Pedicellus of male with unicellular glands and a small spur on its base. Mouthparts not specialized. Mandibles strongly sclerotized apically and with usual teeth. Galea apically with several sensory pegs. Lacinia heavily sclerotized distally; first

process of lacinia pectinate. Labium without prominent lateral lobes.

Tarsi with 4 articles. Praetarsi with 3 simple claws, median claws glabrous, slender, and smaller than lateral claws.

Abdominal sterna II (apparently)-III-VII subdivided into coxites and sternite. Sterna VIII and IX of male entire. Sterna II-VII with 2 + 2 macrochaetae. Coxites on segments II-IX with stylets. Eversible vesicles on segments II-VI, pseudovesicles on VII. Urosternum VIII with a wide and not too deep posterior emargination. Posterior projections acute to slightly rounded, pointing slightly outward. Tergum X protruding, almost straight on posterior border, posterior angles with 2 or 3 subequal macrochaetae. Urosterna III and IV simples. Cerci of male with modified spines.

Parameres with a cleft and specialized setae on apex. Opening of penis longitudinal.

*Type species.*—*Squamigera latebricola*.

*Etymology.*—Latin *Squamigera* = scale bearing, scaly. Here treated as a noun in the nominative singular. Gender, feminine. Makes reference to its body covered with scales.

*Distribution.*—The only individual found is from "Cueva de las Pozas Azules" cave, Taxco de Alarcón Municipality, Guerrero State, México, 18°36'40"N, 99°33'25"W.

*Remarks.*—*Squamigera* belongs to a group of nicoletiid genera, the Cubacubaninae (Mendes 1988), characterized by subdivided abdominal sterna II-VII and fused coxites of VIII and IX abdominal segments of the male. *Squamigera* is distinguished from almost all genera of this subfamily by having scales. It differs from *Texoreddellia*, the only other genus with scales, by the morphology of scales, having scales on head, morphology of parameres, and modified spines in male cerci.

The genus shares with *Anelpistina* (Silvestri 1905 as subgenus), *Prosthecina* (Silvestri 1933), and *Cubacubana* (Wygodzin-sky & Hollinger 1977), the presence of spines in cerci and a posterior emargination on urosternum VIII, which are absent in

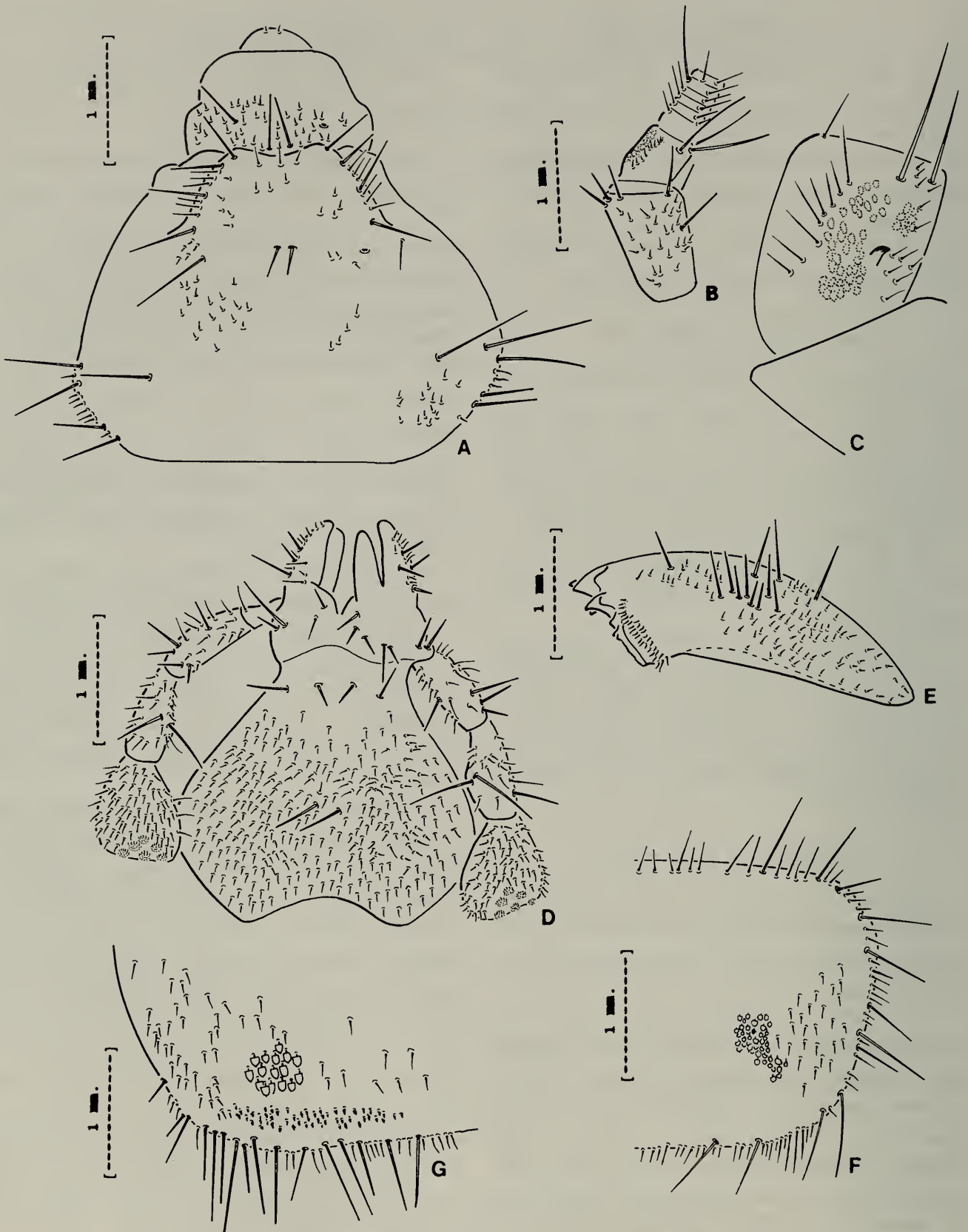


Fig. 1. *Squamigera latebricola* new genus. (Male): A, Head; B, Basal article and pedicellus of antenna; C, Small spur of pedicellus; D, Labial palp and labium; E, Mandible; F, Thoracic tergum (scales and setae partially shown); G, Posterior border of metanotum (scales partially represent).

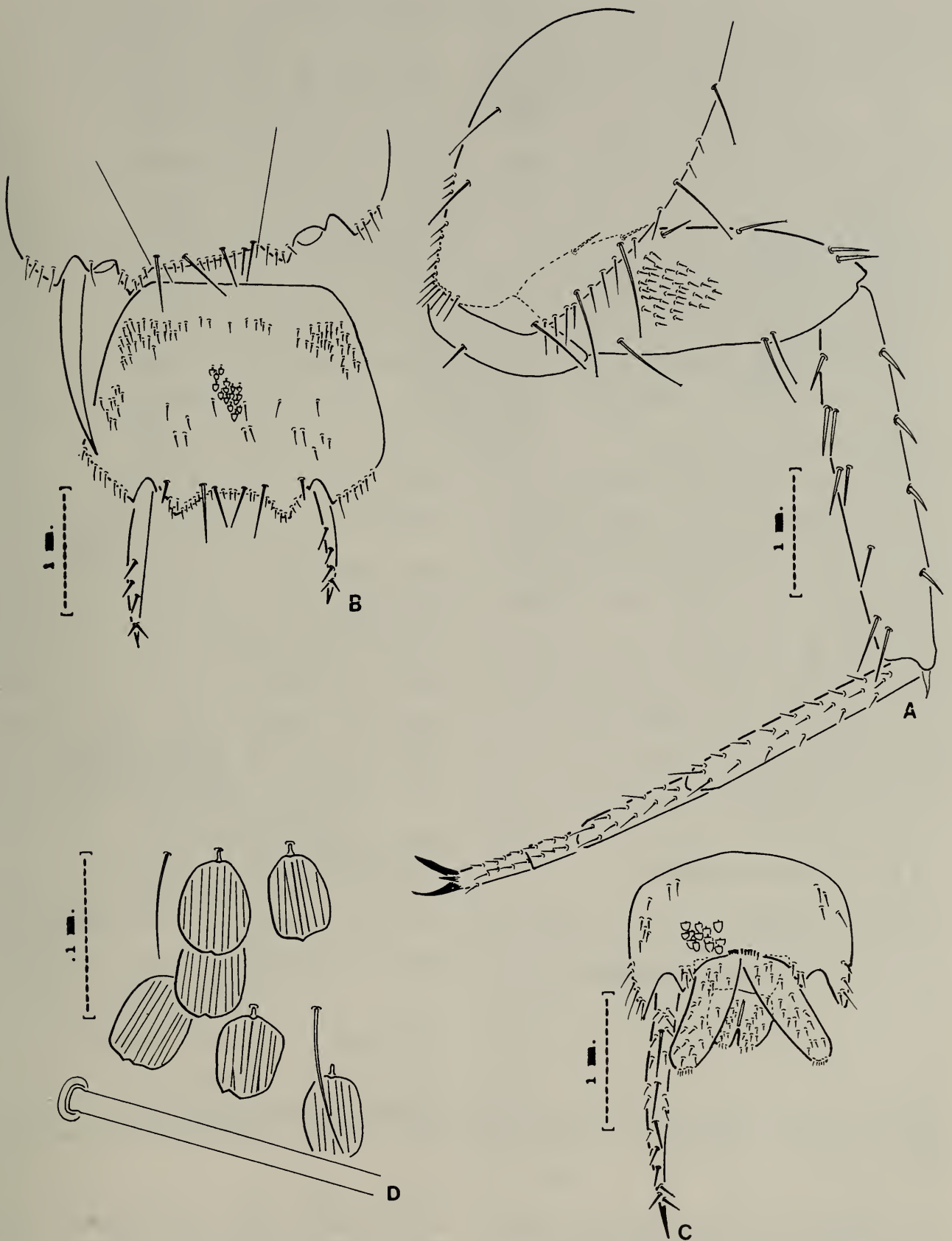


Fig. 2. *Squamigera latebricola* new genus. (Male): A, Hind leg, microchaetae partially shown, scales not shown; B, Urosternum VII and VIII (scales and setae partially shown); C, Genital area; D, Scales of head.

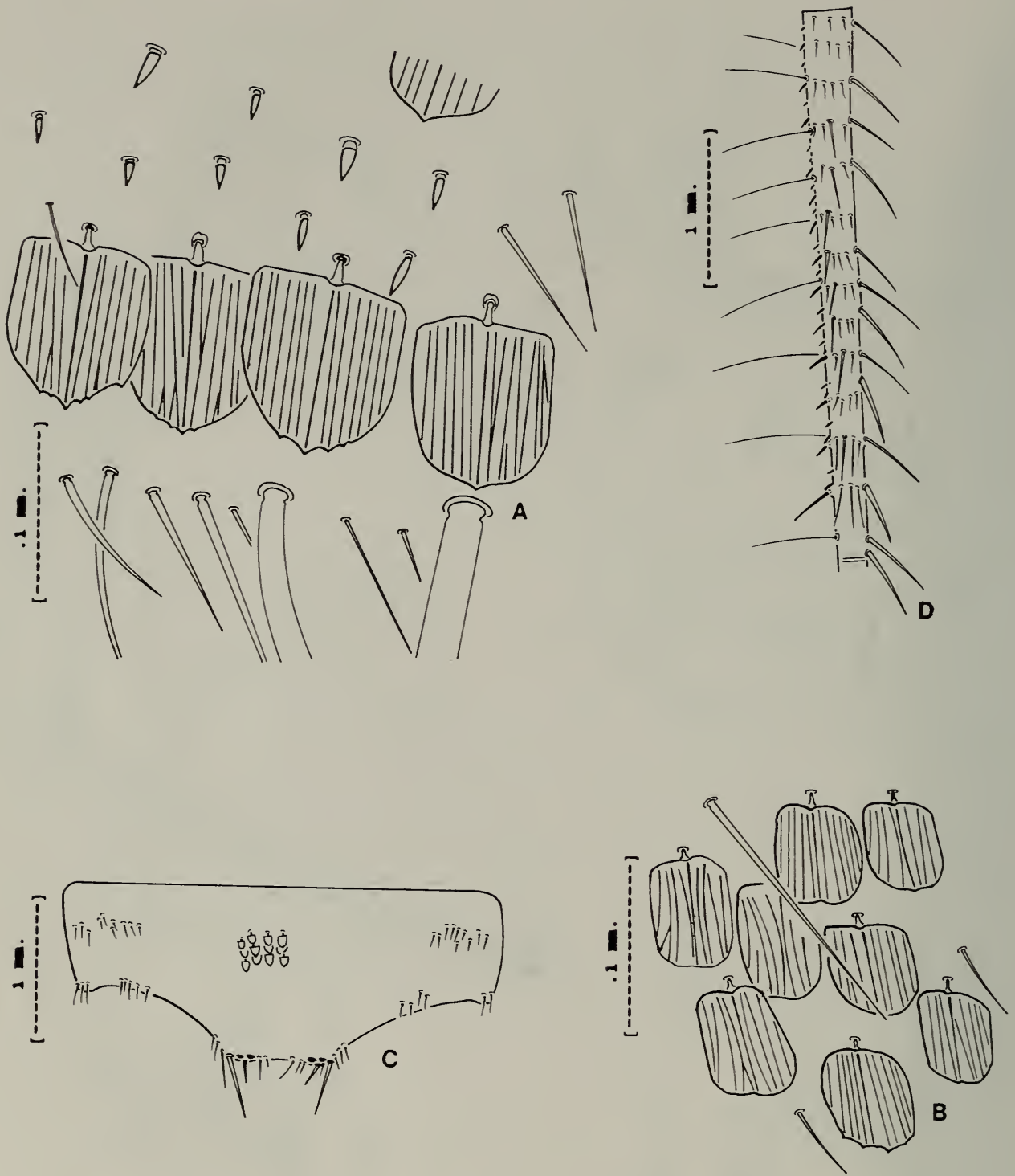


Fig. 3. *Squamigera latebricola* new genus. (Male): A, Scales and spines of the posterior border of the metanotum; B, Scales of urotergum I; C, Urotergum X (scales and setae partially shown); D, Cercus basal portion.

*Texoreddellia*. It is possible that *Squamigera* has closer affinities with this group of species than with *Texoreddellia*.

*Squamigera latebricola*, new species

Figs. 1A–G, 2A–D, 3A–D

*Material examined*.—México. Guerrero: Taxco de Alarcón, Cueva de las Pozas Azu-

les (+53 meters deep, 1399 meters long). 3 Dec 1988, R. Espinasa-Closas col. Male holotype.

*Description*.—Maximum body length 22.0 mm. Maximum length of antennae unknown (broken), of caudal appendages 28.0 mm. Body and legs robust. Head, thorax, abdomen, and proximal articles of legs cov-

ered by scales (Figs. 2D, 3A, B). General color light yellow to white.

Head with macrochaetae and microchaetae as shown in Fig. 1A. Basal article of antennae in males has a small projection with 2 macrochaetae. Pedicellus of antennae of male as shown in Fig. 1C, with 5 clusters of unicellular glands and a small sclerotized spur. Mouthparts relatively long. Apex of maxillary palp similar to *Texoredellia*, but with a third very small extra conule. Labial palp long, apical article barely longer than wide, labium and first article of labial palp with macrochaetae (Fig. 1D). Mandible without very small pegs over the bigger tooth. Setae as shown in Fig. 1E. Legs as shown in Fig. 2A, relatively long; hind tibia approximately 5 times longer than wide; claws of normal size.

Cerci of male with a longer than wider basal article and a very long second article, followed by short articles of subequal size. In the very long article the spines start almost at its base until they become a more prominent group; the relatively long spines are inserted on distinct tubercles (Fig. 3D). Compared with other genus of the subfamily, spines are relatively small.

Thoracic terga with long macrochaetae (Fig. 1F), very abundant on all borders. Also, on the posterior border they show a series of small sclerotized spines (Figs. 1G, 3A). Tergum X protruding, almost straight on the posterior border (Fig. 3C).

Urosterna III and IV of male without modifications. Urosternum VIII with a wide and not too deep posterior emargination. Posterior projections acute to slightly rounded, pointing slightly outward (Fig. 2B).

Urosternum IX of male slightly curved behind and centrally on the posterior border with macrochaetae slightly more sclerotized (Fig. 2C). Point of insertion of parameres in urosternum IX is deep, with internal face of coxal processes with macrochaetae more sclerotized (Fig. 2C) similar to some members of the genus *Anelpistina*.

Stylets IX bigger than the others, with 6

macrochaetae and an extra subapical pair. The other stylets only have 3 macrochaetae and an extra subapical pair. In males, styles IX without other modifications.

Penis and parameres as in Fig. 2C. Parameres curved outward, attaining less than  $\frac{1}{2}$  the length of stylets IX. Surface of parameres with a cleft and short setae.

*Etymology*.—Latin *latebricola* = One who dwells in lurking places. Gender masculine. Makes reference to the cavernicole habitat where this species dwells.

*Remarks*.—Despite several trips to Pozas Azules cave, only a single male was collected. Because of its size, this specimen is probably an adult with all the secondary sexual characters developed. Individuals at different stages of the postembryonic development might differ in characters, such as the number and size of spines in cerci.

Many caves in this area of Guerrero, México, have been explored and have yielded many individuals of the family Nicoletiidae (Espinasa 1991), but all from different genera. The one locality where *S. latebricola* has been found is in this single cave. Therefore it is probably a troglobite with a very restricted geography.

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